

**U.S. Department of the Interior  
Bureau of Land Management**

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**Environmental Assessment  
Arrow Canyon Hazardous Fuels and Weed Reduction  
April 14, 2012**

**DOI-BLM-NV-S010-2012-0059-EA**

**DRAFT**

**PREPARING OFFICE**

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# **Environmental Assessment**

## **Arrow Canyon Hazardous Fuels and Weed Reduction**

**April 14, 2012**

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# **Chapter 1. Introduction**

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## **1.1. Identifying Information:**

### **1.1.1. Title, EA number, and type of project:**

Arrow Canyon Hazardous Fuels and Weed Reduction

DOI-BLM-NV-S010-2012-0059-EA

Hazardous Fuels and Weed Management

### **1.1.2. Location of Proposed Action:**

Mt. Diablo PM

Arrow Canyon, Nevada

T. 14 S., R. 64 E. Section 3

### **1.1.3. Name and Location of Preparing Office:**

U.S. Department of the Interior

Bureau of Land Management

Southern Nevada District Office

Division of Fire and Aviation

4701 N. Torrey Pines Drive

Las Vegas, NV 89130

## **1.2. Purpose and Need for Action:**

There are several documented infestations of tamarisk and other weed species within Pahrnagat Wash between Table Mountain and Arrow Canyon Dam. These infestations total approximately 45 acres, of which 22 acres are within the Arrow Canyon Wilderness boundary (T. 14 S., R. 64 E., N 1/2 of Sections 4 and 5).

The purpose is to reduce wildland fire potential, preserve wilderness characteristics, protect sensitive cultural resources and improve ecosystem quality and function within the Pahrnagat Wash at Arrow Canyon. The need for the action is established by Executive Order 13112 for the prevention and control of invasive species, the following exist in Arrow Canyon: red brome (*Bromus madritensis*), cheatgrass (*Bromus tectorum*), Malta starthistle (*Centaurea melitensis*), Scotch thistle (*Onopordum acanthium*), and tamarisk (*Tamarix ramosissima*). These species

are creating hazardous fuels conditions, altering habitat function and displacing native species within the Pahranaagat Wash.

## **Decision to be made:**

The Bureau of Land Management (BLM) will determine which methods to utilize to manage the non-native invasive species prevalent within Pahranaagat Wash.



**Landscape view of Pahranaagat Wash, facing south.**

**Figure 1.1. Pahranaagat Wash.**

## **1.3. Scoping, Public Involvement and Issues:**

The BLM conducted internal scoping. The Proposed Project was scoped by the U.S. Fish and Wildlife Service for the formal Section 7 Consultation pursuant to the Endangered Species Act (ESA) of 1973.

Postcards soliciting comments on the Proposed Project were sent to the Wilderness interested parties mailing list and a Wilderness Notification was posted on the BLM Southern Nevada District Office Web site ([www.blm.gov/nv/st/en/fo/lvfo.html](http://www.blm.gov/nv/st/en/fo/lvfo.html)).

## **Chapter 2. Proposed Action and Alternatives**

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## 2.1. Description of the Proposed Action:

The BLM proposes active vegetation management within Wilderness and non-wilderness portions of Arrow Canyon which are heavily infested by noxious weed species and hazardous fuels (Fig. 2.1. & 2.2). The Proposed Action would include a combination of broadcast burning, herbicide application and cut stump treatment to remove weeds from Arrow Canyon; followed by planting and/or seeding to establish a native plant community in the Project Area.

Obstacles to managing the weeds within Pahrnatag Wash include existing dead tamarisk throughout the Proposed Project Area. Beginning with broadcast fire would remove standing dead tamarisk and thistles, allowing for more complete access to the understory during herbicide treatments. Broadcast fire would act as a more natural process to begin the restoration of Arrow Canyon.

Prescribed fire operations would be conducted in accordance with an approved prescribed burn plan and carried out using qualified staff from the BLM. Successful protection of important cultural resources has been undertaken in the past by removing material that would subject adjacent rock art panels to direct flame impingement. Again removing materials to create a buffer around the sensitive area, in addition to strategic placement of fire resources, would provide sufficient panel protection during the operation.

Cut stump and/or foliar herbicide treatment would be applied soon after burn treatments to remove any remaining noxious weeds. The cut stump method involves cutting tamarisk to near ground-level. Tamarisk would be removed by using hand tools and chain saws. Within 10 minutes of cutting mature tamarisk, a mixture of triclopyr (Garlon 4) and basal oil would be painted or sprayed on each stump in accordance with label instructions. Smaller tamarisk sprouts would receive a foliar treatment of imazapyr (Arsenal) and triclopyr.

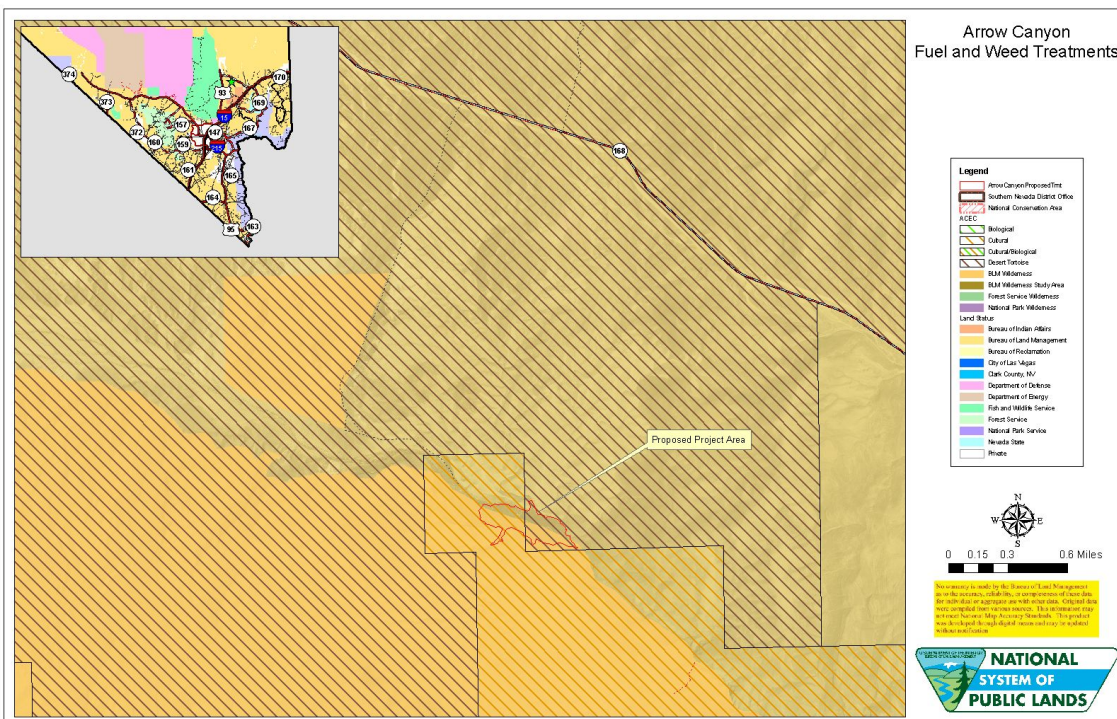
The area of thistle infestation is approximately the same as tamarisk within Pahrnatag Wash. Herbicide formulations of metsulfuron methyl or clorpyralid would be mixed with water for foliar treatment applied to thistle using a backpack sprayer. Non-toxic, temporary marking dye would be added to all herbicide treatments to insure proper coverage.

Seasonally, tamarisk re-sprouting would be treated by a directed low volume foliar or basal bark application of herbicide and noxious weeds would be treated with a combination of treatment with hand tools (non-motorized, non-mechanized) and ground foliar application of herbicide. Ongoing retreatment would be implemented until native species can be reestablished.

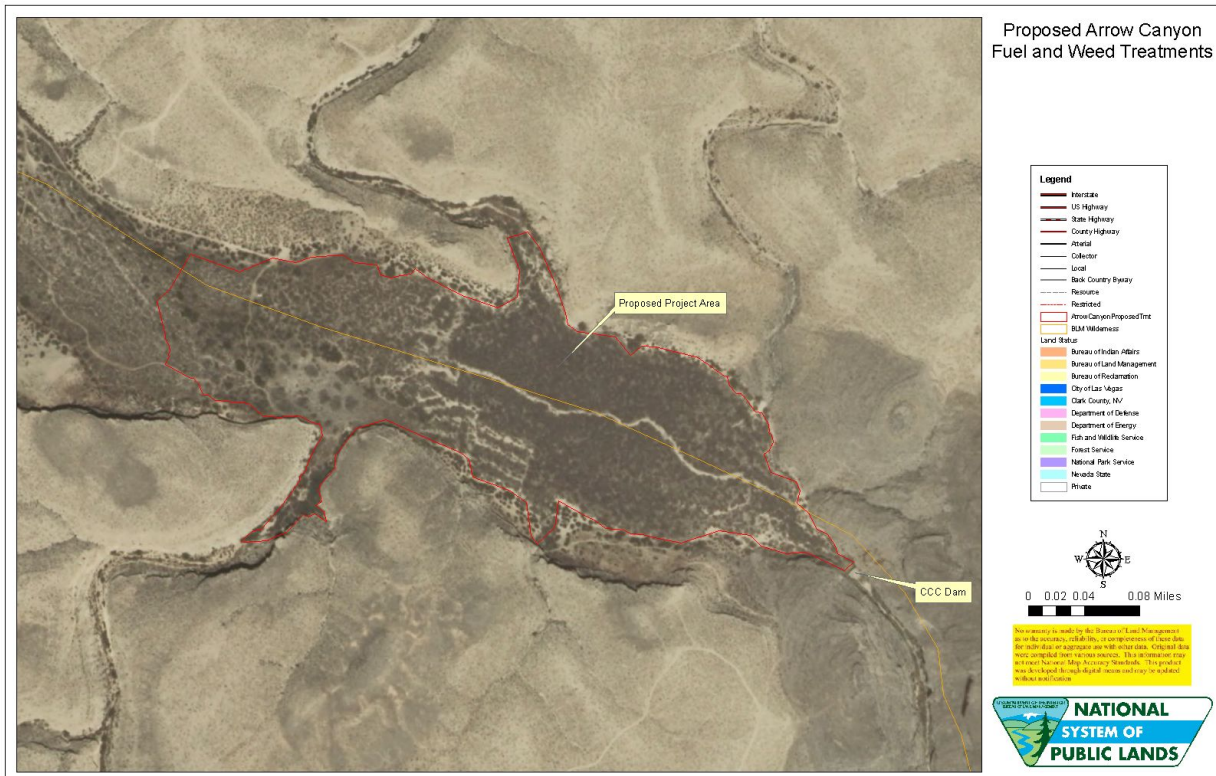
All herbicide formulations selected and application techniques used would conform with temperature, wind, and precipitation parameters, as well as all Standard Operating Procedures (SOPs), mitigation measures and conservation measures listed in the Record of Decision for the Vegetation Treatments Using Herbicides on BLM lands in 17 Western States Programmatic Environmental Impact Statement (signed September 2007), the current Las Vegas Resource Management Plan and EIS and current U.S. Environmental Protection Agency (USEPA) regulations. Fuels management such as tamarisk cutting and herbicide application would occur over approximately eight weeks throughout the course of each year, depending upon labor availability, biological conditions (e.g. plant phenology) and environmental conditions. Handcrews may consist of approximately 25 individuals. Applications would be coordinated with tortoise and habitat specialists to insure the time of year, weather and other conditions do not adversely affect wildlife.

The BLM Hazardous Fuels Program would coordinate with the Restoration or Weeds Programs to implement an aggressive revegetation program including a combination of seeding and/or planting. Selected species would be tolerant of the degraded site conditions and possible herbicide residue, and would be typical of Mesquite bosque. Revegetation would likely occur one to two seasons after initial herbicide application to prevent harming newly introduced plants. The weed management actions followed by revegetation using hand tools (i.e., planting and/or reseeding with non-motorized, non-mechanized means) that are proposed would occur annually for not less than six years and potentially into perpetuity, until noxious species in the seed bank are exhausted and a healthy, resilient native plant community has been established.

Biocontrol in the form of the tamarisk beetle (*Diorhabda elongata*) will continue to effect the site.



**Figure 2.1. Map of Proposed Project**



**Figure 2.2. Aerial of Project Area**

## 2.2. Description of Alternatives Analyzed in Detail:

### No action

Under the No Action Alternative non-native invasive plants within the Pahrangat Wash of Arrow Canyon would not be treated. The extent and dominance of tamarisk, Malta starthistle, Scotch thistle and potentially new exotic species would continue to increase. Their dominance would preclude establishment by native species. Additionally, the build up of hazardous fuels would continue, contributing to the potential for an uncontrolled wildland fire.

### 2.3. Alternatives Considered but not Analyzed in Detail

Alternatives to the Proposed Action that were considered but eliminated from detailed analysis included: mechanized control, legally designated noxious weed control and grazing control.

### Hand Tool Removal and Treatment

Using hand tools such as cross cut saws, hand saws, pulaski, and or axes to remove tamarisk prior to herbicide treatment was considered in the wilderness. This alternative was eliminated because the feasibility of using hand tools only (i.e., non-motorized, non-mechanized) for initial treatment of the tamarisk stands is limited due to the size and extent of the current infestation. The preferred alternative of broadcast burning and, if necessary, the use of power tools will

reduce the duration of human presence in the wilderness area and will more effectively protect cultural resources and wilderness values.

## **Heavy Machinery Control**

Using a brushhog and/or bulldozer to remove tamarisk within the portion of the Proposed Project Area that lies outside of Arrow Canyon Wilderness was considered. Any remaining stumps and any new sprouts would be hand sprayed with herbicide. This alternative was eliminated because heavy equipment would create a larger and more intense disturbance footprint than the Preferred Alternative. Additionally, heavy equipment was considered to be more than the minimum necessary tool to accomplish the task within the Arrow Canyon Wilderness; creating a distinct difference between the Wilderness and non-Wilderness Project Area.

## **Legally designated noxious weed control**

Only Malta starthistle would be treated. Malta starthistle is the sole species found on site that is legally designated as Category A within the State of Nevada. Category A is the most stringent designation; control is mandatory for species within this category. The Malta starthistle occupies a small portion of the entire wash, and according to ocular estimates, is the least dominate component of the wash. This alternative was eliminated because it would not address the hazardous fuels found onsite.

## **Grazing control**

Controlling hazardous fuels and weeds using directed grazing was considered. However, sheep and cattle will not graze Scotch thistle (Kadrmaz, T. 2002), thus this alternative was eliminated from analysis.

## **2.4. Conformance**

The Proposed Action would comply with the following Federal Regulations, directives, policy plans and strategy plans:

- Clean Water Act (33 USC 1251) Section 404
- Las Vegas Resource Management Plan (RMP), 1998; Activity: Riparian Management Decision. RP-1-f, Vegetation Management Decision VG1a, and Fire Management Decision FE-3-a
- Las Vegas Fire Management Plan, 2004 Prescribed Fire, Chapter 4, pages 354-355
- Federal Land Policy and Management Act (FLPMA)
- BLM implementation strategy (community assistance, hazardous fuels reduction)
- Nevada Weed Management Strategy (IB-97-137)
- Executive Order 13112 (February 3, 1999) for the prevention and control of invasive species

- The Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (EIS) (2007)
- The Wilderness Act of 1964 (16 U.S.C. §§ 1131–1136, September 3, 1964, as amended 1978)

In addition to following compliance, the Proposed Action follows the guidelines and methods approved for the vegetative manipulation found in the programmatic document, Vegetative Treatments on BLM Lands in 17 Western States, Final Programmatic Environmental Report (June 2007). The report outlines the methods to be used, specifies approved chemicals and allowed application rates, compares treatment impacts, and analyzes environmental and cumulative impacts.

The Council of Environmental Quality regulations at 40 CFR 1508.28, provides for tiering this Environmental Assessment (EA) to a broader EIS. This EA tiers to Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States, Final Programmatic EIS and Record of Decision (ROD) (September 2007). This EA also incorporates by reference, the EIS with respect to herbicides as presented in Volume 1, Chapter 4, pages 4–1, 4–253.

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## **Chapter 3. Affected Environment:**

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The Affected Environment section describes the existing conditions of the environmental resources within the project area. There are several resources that are not present in the project area or are present but would not be affected by the Proposed Action. These resources that were considered but not deemed to be potentially effected by the Proposed Action, Alternative Action or No Action Alternative are noted in Table 1, and will not be discussed further.

The table below summarizes the environmental attributes that have been reviewed, whether they may be affected by the Proposed Action, Alternative Action or No Action Alternative and the rationale for that determination. Elements with identified issues that were further analyzed in the document include: Fish and Wildlife Excluding Federally Listed Species, Floodplains, Fuels/Fire Management, Hydrologic Conditions, Migratory Birds, Invasive Species/Noxious Weeds, Soils, Water Resources/Quality (drinking/surface/ground), Wetland/Riparian, Wilderness, and Woodland/Forestry.

**Table 3.1. Affected Resources Table**

Supplemental Authority	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale
Air Quality		X		The action is administrative in nature. No issues.
Areas of Critical Environmental Concern		X		The proposed action occurs within the Mormon Mesa ACEC which was designated as such by the Las Vegas RMP and the final EIS of 1998 due its biological value as critical desert tortoise habitat. The proposed action will improve the overall health of the Area of Critical Environmental Concern (ACEC) as wildlife habitat, especially for bird species, through removal and treatment of invasive plant species and reestablishment of native species. Additionally the risk of future wildland fires in the area will be reduced.
BLM Natural Areas	X			There are no such designations within the Field Office.
BLM Sensitive Plant Species	X			There are no known occurrences of BLM special status plants species within the proposed project area, no impacts are anticipated in relation to this action.
BLM Sensitive Wildlife Species			X	Analyzed further in EA document.
Cultural Resources		X		Consultation with the State Historic Preservation Office (SHPO) and Native American tribes has occurred previously in preparation for proposed vegetation removal and burning. In a letter dated July 29, 1998, the SHPO concurred with BLM's proposal to hand cut tamarisk, drag the debris to the center of the canyon, and stake for burning. Fire shelter material shall be placed over adjacent cultural features to protect them from fire or smoke damage. If fire lines are constructed by bulldozing, an archaeological monitor will ensure that construction avoids sensitive resources.
Environmental Justice	X			No minority or low-income communities are present in project area.

Farmlands (Prime/Unique)	X			There are no prime or unique farmland designations in the District.
Floodplains			X	The proposed action will increase flow velocity in the floodplain and potentially cause a minimal and temporary increase in erosion. Impacts will be analyzed in detail in the EA document.
Fuels/Fire Management			X	The proposed action will reduce wildfire potential in the canyon and reduce potential impact to sensitive cultural sites. Impacts will be analyzed in detail in the EA document.
Geology/Minerals/Energy Production	X			No issues with the proposed activity.
Greenhouse Gas Emissions		X		Currently there are no emission limits for suspected Greenhouse Gas (GHG) emissions, and no technically defensible methodology for predicting potential climate changes from GHG emissions. However, there are, and will continue to be, several efforts to address GHG emissions from federal activities, including BLM authorized uses.
Human Health and Safety		X		All safety precautions for use of herbicide will be adhered to. Project area is remote and member of the public should not be impacted.
Hydrologic Conditions			X	The proposed action will alter hydrologic condition behind the Arrow Canyon dam and in Pahranaagat wash. Impacts will be analyzed in detail in the EA document.
Invasive Species/Noxious Weeds			X	The proposed action would reduce weed populations, benefiting weed management in the canyon. Impacts will be analyzed in detail in the EA document. Standard stipulations apply.
Lands/Access		X		The proposed action is within an ACEC. Please follow the special stipulations or protocols provided for by the protected entity. There are no lease or communication sites in the area. There are no issues
Lands with Wilderness Characteristics (LWC)		X		The proposed action is located in an area that underwent a re-inventory for wilderness characteristics as part of the Las Vegas RMP Revision. The proposed action is in conformance with the existing Land Use Plan (LUP) per FLPMA as it relates to management of LWCs.
Livestock Grazing	X			The proposed action is not located in an authorized grazing allotment.
Migratory Birds			X	See EA which includes mitigation measures to minimize and avoid effects to migratory birds.

Native American Religious Concerns		X		Consultation with the SHPO and Native American tribes has occurred previously in preparation for proposed vegetation removal and burning. In a letter dated July 29, 1998, the SHPO concurred with BLM's proposal to hand cut tamarisk, drag the debris to the center of the canyon, and stake for burning. Fire shelter material shall be placed over adjacent cultural features to protect them from fire or smoke damage. If fire lines are constructed by bulldozing, an archaeological monitor will ensure that construction avoids sensitive resources.
Noise		X		During mechanical removal noise from saws and brush cutters will be present. Work will generally take place during the week when visitation is lower.
Paleontological Resources	X			No fossil-bearing strata will be impacted by the proposed action.
Rangeland Health Standards		X		Negative impacts to Rangeland Health are not expected. Adverse impacts to surface hydrology which could also negatively affect rangeland health will be addressed and, if necessary mitigated, under the hydrology section.
Recreation		X		No long term impacts expected. Recreationists should be made aware of chemical treatments in the area, so they can avoid making contact with it.
Socio-Economics		X		This project will not disproportionately impact social or economic values.
Soils			X	The proposed action will impact the local soils behind the Arrow Canyon dam due to increased flow velocity through the wash and floodplain. Impacts will be analyzed in detail in the EA document.
Threatened, Endangered or Candidate Plant Species	X			Not present.
Threatened, Endangered or Candidate Animal Species		X		<p>The above proposed action has a no affect determination on the threatened desert tortoise (<i>Gopherus agassizii</i>). This project will have no affect on any other federally listed species or designated critical habitat. The proposed action occurs within in the Mormon Mesa ACEC which is also designated desert tortoise critical habitat. Where vegetation disturbance will occur is not suitable habitat for desert tortoise, and therefore will have no impact on critical habitat.</p> <p>Historical survey data indicates that the area surrounding access road to the project site is low density tortoise habitat. A site visit conducted on April 12, 2012 by Great Basin Institute Natural Resource Specialist Katie Kleinick confirmed that the project site itself is not suitable habitat for desert tortoise as it is very densely vegetated with Scotch thistle, tamarisk and other invasive</p>

				<p>species which to not provide suitable forage for the species and the substrate is not suitable for burrows.</p> <p>No impacts to desert tortoises are expected and no remuneration fees are required. Compliance with the special stipulations below will help to ensure that no affect to desert tortoise occurs.</p> <p>1) Should a Desert Tortoise enter the project area, all activities will immediately stop until such time as the animal has left the area of its own accord.</p> <p>2) A speed limit of 25 miles per hour shall be required for all vehicles travelling on the existing access road.</p> <p>3) Workers will be instructed to check underneath all vehicles before moving them as tortoises often take cover underneath parked vehicles.</p> <p>This notice will serve as the Section 7 Determination and no additional paperwork will be provided (Sec 7 Log # NV-052-12-082).</p>
Vegetation Excluding Federally Listed Species		X		<p>There are no known occurrences of BLM special status plants species within the proposed project area, no impacts are anticipated in relation to this action. Herbicides pose some risk to non-target terrestrial vegetation, and damage to these plants could adversely affect habitats. Impacts related to the use of herbicides will be reduced by their proper use and application as described on the herbicide label. Potential short-term impacts would be offset by a reduction in competition with non-native species and increased native plant species in the area. Additionally the risk of future wildland fires in the area will be reduced.</p>
Visual Resources		X		<p>The action is administrative in nature. No new disturbances or activities are proposed.</p>
Wastes Hazardous or Solid	X			<p>Mixing of chemicals will be done according to manufacturers specifications.</p>
Water Resources/ Quality (drinking/ surface/ground)			X	<p>The proposed action will increase flow velocity in the floodplain and potentially cause a minimal and temporary increase in erosion. While salinity in Pahrnagat wash will decrease, due to tamarisk removal, turbidity may increase during flow events. Impacts will be analyzed in detail in the EA document.</p>
Wetland/Riparian			X	<p>The proposed action will alter flow velocity and vegetation to more desirable conditions. Impacts will be analyzed in detail in the EA document.</p>
Wild and Scenic Rivers	X			<p>Not present.</p>
Wild Horses/Burros	X			<p>The proposed action is not located in an active herd management area, there will be no impacts to wild horses or burros.</p>

Wilderness			X	The proposed action is not located within or adjacent to Wilderness Study Areas or Instant Study Areas. The proposed action is located within and adjacent to Arrow Canyon Wilderness which is managed so as to preserve its wilderness characteristics. Certain uses are prohibited (i.e., motor vehicles, motorized equipment and mechanical transport) except as determined to be the minimum necessary to administer the area as wilderness. An Minimum Requirements Decision Guide analysis must be completed to determine the minimum tool/activity within wilderness and impacts will be analyzed within the EA.
Fish and Wildlife Excluding Federally Listed Species			X	See EA language below which includes the following to reduce impacts to wildlife species:
Woodland/Forestry			X	Native trees present in the treatment area (willows, mesquites, acacias) will be avoided by the proposed treatments. Control burn events are to take place a sufficient distance away from native trees to ensure they will not be impacted.

### 3.1. Fish and Wildlife Excluding Federally Listed Species

The proposed project area supports and is adjacent to lands that support wildlife characteristic of the Mojave Desert. Biological diversity varies according to topography, plant community, proximity to water, soil type, and season.

Several common species of reptiles that may be present in the vicinity of the proposed project site include the western whip-tail (*Cnemidophorus tigris*), desert iguana (*Dipsosaurus dorsalis*), side-blotched lizard (*Uta stansburiana*), zebra-tail lizard (*Callisaurus draconoides*), desert tortoise (*Gopherus agassizii*), western shovel-nosed snake (*Chionactis occipitalis*) and garter snake (*Thamnophis* sp).

Common bird species that may be present in the vicinity of the proposed project site include the rock wren (*Salpinctes obsoletus*), black-throated sparrow (*Amphispiza bilineata*), turkey vulture (*Cathartes aura*), common raven (*Corvus corax*), phainopepla (*Phainopepla nitens*), and red-tailed hawk (*Buteo jamaicensis*).

Common mammal species include the black-tailed hare (*Lepus californicus*), the desert cottontail (*Sylvilagus audubonii*), coyote (*Canis latrans*), badger (*Taxidea taxus*), kit fox (*Vulpes macrotis*) and many species of rodents.

Additionally, the following BLM sensitive species may be present in the general area: western burrowing owl (*Athene cunicularia hypugaea*), chuckwalla (*Sauromalus ater*), banded Gila monster (*Heloderma suspectum cinetum*), Mojave shovel-nosed snake (*Chionactis occipitalis occipitalis*), desert glossy snake (*Arizona elegans eburnata*), and Mojave Desert sidewinder (*Crotalus cerastes cerastes*).

## 3.2. Floodplains

The proposed project would occur on the floodplain of Pahranaagat Wash just upslope of the entry to Arrow Canyon at approximately 2000 feet in elevation. The wash is bounded by near vertical rock bluffs on each side. Flooding events are rare. The earliest records date to the 1925 flood (prior to the dam construction); it was estimated that discharge from Arrow Canyon reached 1,485 cubic feet per second (cfs) while the 1938 flood (post dam construction) was estimated to have peaked between 1,400 and 1,800 cfs (Shamberger 1940).

## 3.3. Fuels and Fire Management

Infestations of non native plants in the Arrow Canyon area has led to a large fuels and fire management problem. Tamarisk has established throughout the canyon area and would allow direct flame impingement to many important cultural resources in the event of an unplanned wildland fire.

## 3.4. Hydrologic Conditions

The drainage area above the Arrow Canyon Dam has been defined dissimilarly in the past. Historically, it has been thought to be mainly the northerly and easterly slopes of the Sheep Mountains, the Pahranaagat Valley, the Arrow Canyon Mountains and the westerly slopes of the Meadow Valley Mountains, rising to elevations of over 8,000 feet in the Sheep Mountains and has estimated to be about 1000 mi<sup>2</sup> (Shamberger 1940) to 740 mi<sup>2</sup> (Mauney 2012 using a 10-meter DEM). However, most recently, Mauney (2012) delineated the drainage area by hand, due to the majority of the basin being relatively flat and determined a drainage area of only 34 mi<sup>2</sup> limiting it to the northern and western portion of the Arrow Canyon Mountain Range. After considering non-contributing areas of depressions within the basin, the contributing area is estimated to be 28 mi<sup>2</sup>. The canyon itself extends onwards, above the dam, in a northwesterly direction and about six miles above Arrow Canyon its walls come together, forming Double Canyon. Beyond Double Canyon the canyon divides into two canyons, the main one becomes Pahranaagat Wash consisting of an additional 35 miles of dry channel through the Coyote Springs Valley.

The purpose of this dam was apparently flood and silt control. At the present elevation there is a storage capacity of slightly in excess of 300 acre-feet and this amount has been reduced somewhat due to the silt deposit. Water will only be present in the basin-fill sediments behind the dam following major precipitation and storm events within the drainage basin. Arrow Canyon Dam itself rises 35 feet above flowline and has a 24 inch pipe 15 feet above the toe of the dam. Bedrock is exposed in Arrow Canyon just past the dam. The basin-fill sediments upstream of Arrow Canyon Dam range from 3 meter m (at the base of the dam) to less than 200 m in that part of Coyote Spring Valley (Eakin 1964).

The occurrence of ground water in carbonate rocks is evident from the springs in Pahranaagat Valley to the north of Coyote Spring Valley and in the Muddy River Springs area. The storage and transmission of ground water in carbonate rocks beneath the valleys is inferred - from the fact that the Sheep Range is an area where carbonate rocks are exposed extensively and also that the Sheep Range is a favorable area for receiving recharge from precipitation. However, the intervening Arrow Canyon Range probably has insignificant recharge to afford a hydraulic barrier to underflow from the Sheep Range. On this basis the Meadow Valley Mountains and

the Arrow Canyon Range apparently supply a negligible amount of recharge to the overall groundwater system (Eakin 1964).

### **3.5. Invasive Species/Noxious Weeds**

An EA (EA-052–98–033) was completed in 1998 to consider tamarisk treatment in this wilderness area. In 2003, 2006 and 2008 weed treatments were conducted on the site. In 2003, tamarisk was cut and stumps were treated with herbicide. There were some pile burns, however, there were piles of slash left on site as well. The National Park Service Exotic Plant Management Team conducted weed treatments of tamarisk, Malta starthistle and Scotch thistle in 2006 and 2008. There was no revegetation conducted after treatments for any of these projects.

The plant community within Pahranaagat Wash is dominated by non-native plant species including Scotch thistle, Malta starthistle, tamarisk, cheatgrass and Sahara mustard.

#### **Red brome and cheatgrass**

Red brome and cheatgrass dominate the area surrounding the roadway along the immediate approach to the project site. These non-native annual grasses are well established along the periphery of the wash and also occur in openings where tamarisk and Scotch thistle aren't already established within the wash. Native grasses tend to decompose each year, whereas these grasses remain standing and cure, creating hazardous fuels.

#### **Malta starthistle**

A Class A noxious weed in the State of Nevada, Malta starthistle is primarily found along the eastern edge of the project area. Malta starthistle is an annual plant that reproduces by seed. It has a yellow flower, is spindly and no more than 12 inches tall in the project area.

#### **Scotch thistle**

A Class B noxious weed in the State of Nevada, Scotch thistle is concentrated within areas of the wash where tamarisk was previously removed. Scotch thistle in the project area often reaches more than six feet tall and has long thorns along its stems and leaves, making manual control challenging.

#### **Tamarisk**

Tamarisk is a Class C noxious weed in the State of Nevada, and is currently established and widespread throughout Nevada. Tamarisk is the visual dominant of the Pahranaagat Wash basin. At any particular time, leafed-out flowering, defoliated and standing dead tamarisk dominate the basin. Piles of previously cut tamarisk are scattered throughout small areas where there are not standing tamarisk.

### 3.6. Migratory Birds

Under the Migratory Bird Treaty Act of 1918 (MBTA) and subsequent amendments (16 U.S.C. 703-711), it is unlawful to take, kill, or possess migratory birds. Numerous bird species travel through Nevada during spring and fall migrations. A list of the protected bird species can be found in 50 C.F.R. §10.13. The list of birds protected under this regulation is extensive and the project site has potential to support many of these species, including the BLM designated sensitive western burrowing owl (*Athene cunicularia*). Typically, these species are most sensitive to disturbance during the breeding season, which generally occurs from March 1 through August 31.

### 3.7. Soils

The intermediate slopes of Pahrangat Wash in Coyote Springs Valley include both alluvial fans and pediments. Pediments appear similar to alluvial fans but are an erosional surface mantled with a thin veneer of alluvium. In contrast, alluvial fans are composed of thick deposits of alluvium deposited by runoff from the mountains of the drainage area. These deposits provide the silt and fill material that is currently deposited behind Arrow Canyon Dam. According to the U.S. General Soil Map (STATSGO2) the soils in the basin are estimated to be Hydrologic Soil Group D, which equates to an infiltration rate of 0.05 to 0.10 in/hour.

### 3.8. Water Resources/Quality (drinking/surface/ground)

The water stored behind Arrow Canyon Dam is not used for drinking water purposes. Other water resources are described in Section 3.4

### 3.9. Wetlands/Riparian Zones

Wetlands do not exist in the project area. Shallow groundwater elevation following precipitation events in the drainage basin described above, provide conditions for riparian vegetation in the project area. However, currently the riparian zone is dominated by plant species described in Section 3.5.

### 3.10. Wilderness/WSA

The United States Congress established the National Wilderness Preservation System to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States. Wilderness designation is intended to preserve and protect certain lands in their natural state. The Wilderness Act of 1964 and subsequent enabling legislation for specific areas, identifies wilderness uses and prohibited activities. Although wilderness character is a complex idea and is not explicitly defined in the Wilderness Act, wilderness characteristics are commonly described as:

- **Untrammeled** — are is unhindered and free from modern human control or manipulation.
- **Natural** — area appears to have been primarily affected by the forces of nature.
- **Undeveloped** — area is essentially without permanent improvements or human occupation and retains its primeval character.



- **Outstanding opportunities for solitude or a primitive and unconfined type of recreation** — area provides outstanding opportunities for people to experience solitude or primeval and unrestricted recreation, including the values associated with physical and mental inspiration and challenge.
- **Supplemental values** — complementary features of scientific, educational, scenic or historic values.

Arrow Canyon Wilderness is predominantly free of trammeling activities and is limited to the big game wildlife water development, Civilian Conservation Corps era Arrow Canyon Dam, and minimal geologic sampling. The wilderness is essentially without permanent improvement; evidence of modern human occupation are limited to the water development, dam, former vehicle routes, mining test pits, spray paint graffiti, and permanent fixed anchors (i.e., bolt and hanger) for technical rock climbing. The wilderness generally appears natural, but the presence of some non-native invasive weeds has reduced this wilderness characteristics. Opportunities for solitude are outstanding throughout the majority of the wilderness; most use occurs in the Pahranaagat Wash area of Arrow Canyon, upstream and downstream of the dam. Opportunities for primitive and unconfined types of recreation are exceptional and include hiking, backpacking, horseback riding, hunting, photography, wildlife viewing, and technical rock climbing; the only the 14 day stay limits recreation in this wilderness. Other supplementary features include the unique geology, cultural resources, and critical habitat for the threatened desert tortoise.

### 3.11. Woodland/Forestry

Cactus and yucca are considered government property and are regulated under the Nevada BLM forestry program. Cactus and yucca species typically do not occur in the plant community present at proposed treatment site. However, access to the site traverses suitable habitat for cactus and yucca.

The proposed action occurs within invasive riparian woodlands and mesquite acacia woodlands plant communities. Although dominated by invasive species, these vegetation types still support a disproportionately high diversity of wildlife, in particular bird species.

Mesquite acacia woodlands typically occur on the edges of large watercourses such as perennial rivers and streams, but also occur growing in scattered clumps on sandy hummocks and near desert springs where groundwater levels are high. Because of tamarisk and other nonnative species, most low elevation riparian woodlands in the district are at a high risk of losing key ecosystem components.

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## **Chapter 4. Environmental Effects:**

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The Environmental Effects section describes the potential effects of the Proposed Action, Alternative Action and No Action Alternative on the environmental resources within the project area. This section provides analysis of the environmental consequences of the Proposed Action, Alternative Action and No Action Alternative to determine if the Proposed Project will require further investigation to determine the significance of impacts.

## **4.1. Direct and Indirect Effects**

Resource issue impacts describe whether the Proposed Action, Alternative Action or No Action Alternative would have direct or indirect effects on a resource. Direct effects are effects which are caused by the action and occur at the same time and place. Indirect effects are those effects which are caused by the action and are later in time or farther removed in distance, but still occur in the reasonably foreseeable future.

### **4.1.1. Fish and Wildlife Excluding Federally Listed Species**

#### **4.1.1.1. Proposed Action**

Wildlife species would be displaced as invasive plant species are burned within the project area. The primary direct impact of the proposed action on wildlife would be killing of animals during burning of tamarisk piles and the loss of habitat and cover the large amount of invasive species are currently providing. Standard operating procedure to shake and prod piles prior to burning to scare out any animals will help reduce these impacts. Additional impacts associated with mortality from vehicular traffic may also occur during proposed activities.

Herbicides pose risks to wildlife, accidental spills and direct spraying of organisms could kill or harm animals, or affect the health and behavior of animals. Wildlife could also forage on vegetation that has been treated, or prey on other animals that have been exposed to herbicides, and be harmed. Herbicides pose some risk to non-target terrestrial vegetation, and damage to these plants could adversely affect habitats used by wildlife. Impacts related to the use of herbicides will be reduced by their proper use and application as described in the proposed action and the herbicide label.

Wildlife species in the general area are common and widely distributed throughout the area and the loss of some individuals and/or their habitat would have a negligible impact on populations of the species throughout the region. Impacts to BLM Sensitive Species are not anticipated to lead to further decline of the species range wide as the total disturbance for this project is relatively small.

Upon completion of proposed restoration activities, wildlife habitat, particularly for bird species, within the project area will be improved as a result of native vegetation reestablishment and the risk of future wildland fires in the area will be reduced.

#### **4.1.1.2. No Action**

If no action is taken the short term impacts to wildlife will not take place, however, long term benefits to wildlife, through removal of non natives, will not occur.

## **4.1.2. Floodplains**

### **4.1.2.1. Proposed Action**

The proposed action will increase flow velocity in the floodplain and potentially cause a minimal and temporary increase in erosion.

### **4.1.2.2. No Action**

If no action is taken the short term impacts to the floodplain will not take place.

## **4.1.3. Fuels and Fire Management**

### **4.1.3.1. Proposed Action**

Under the proposed action the hazardous fuels accumulation in Arrow Canyon would be substantially reduced. Removal of tamarisk and Scotch thistle from the canyon will allow native vegetation an opportunity to reestablish. Previous treatments have not been fully implemented and have resulted in piled tamarisk being left behind, the remnant fuel will consume during burning operations. The use of broadcast burning in this area minimizes the need for mechanized removal of tamarisk which is in line with wilderness objectives.

The remoteness of Arrow Canyon limits the ability of firefighting resources to respond quickly in the event of a wildland fire. Many important cultural resources sites exist in Arrow Canyon and have consumable fuel fuels that would allow direct flame impingement in the event of a fire. By removing the fuels these resources would not be at risk of being destroyed in the event of a long response to a wildland fire.

### **4.1.3.2. No Action**

If no action alternative is selected hazardous fuels would remain in the canyon, preventing the reestablishment of natural vegetation and leaving cultural resources vulnerable to fire.

## **4.1.4. Hydrologic Conditions**

### **4.1.4.1. Proposed Action**

The proposed action will alter hydrologic condition behind the Arrow Canyon above and below the dam. The removal of the undesirable vegetation will increase infiltration rates and flow velocities upstream of the dam. This will occur during or shortly after precipitation events until replacement vegetation will have established similar biomass — for approximately 5 to 7 years. During the same timeframe the reduced biomass will result in decreased evapotranspiration rates, which, in turn, will increase the water availability for revegetation (natural or artificial) and will increase the water elevation behind compared to current conditions. This may cause the water elevation to reach above 15 feet at the dam sooner and more frequently, depending on climatic conditions, and consequently increase the amount and frequency of flow downstream of the

dam. However, flow velocity and or flooding will not be altered downstream of the dam due to this project.

#### **4.1.4.2. No Action**

If no action is taken the short term impacts to the hydrologic conditions will not take place.

### **4.1.5. Invasive Species/Noxious Weeds**

#### **4.1.5.1. Proposed Action**

The Proposed Action would reduce noxious weeds in the project area if carried out in entirety. If broadcast fire is utilized, but the chemical control is omitted from the treatment regime, it is likely that there would be an increase in tamarisk and noxious species. Likewise, if the burn and herbicide treatments are carried out, but revegetation with native species is not carried out, it is likely that tamarisk, thistles and possibly additional noxious species would recolonize the site. The seed bank in the Proposed Project Area is likely composed predominately, if not entirely, of the noxious species growing on the site. Therefore, without actively introducing desirable native species, native species would not have much likelihood of establishing in the cleared area. Instead, the noxious weeds would compose the new plant community.

The Proposed Action would reduce populations of non-native invasive species and replace them with the native species that are planted during revegetation efforts. Ongoing weed retreatment will be essential for the project to be successful. Noxious weeds are strong competitors, and if land managers do not plan and implement vigilant weed control for multiple years following project initiation, the project would not likely provide a longterm benefit to weed control.

Biocontrol in the form of the tamarisk beetle (*Diorhabda elongata*) would continue to effect the site, possibly accelerating treatment effectiveness.

#### **4.1.5.2. No Action**

The Proposed Action would not be undertaken. The BLM would not be in compliance with Nevada State Law NAC 555.010 which designates and categorizes weeds within Nevada. Thirty species that are categorized as Class A must be actively eradicated wherever they are found. Malta starthistle is a Nevada State Category A, Scotch thistle is a Category B, and tamarisk is a Category C. Along with the species continuing to proliferate in the Pahranaagat Wash, these could also facilitate the dispersal of the species onto additional public lands.

There are few native species currently in the wash. Populations of species remaining would likely continue to decrease. Biocontrol in the form of the tamarisk beetle (*Diorhabda elongata*) would continue to effect the site.

## **4.1.6. Migratory Birds**

### **4.1.6.1. Proposed Action**

The proposed action would have a negative effect on migratory birds as it would remove tamarisk trees and other invasive plant species which provide perches and nesting sites. The loss of habitat would be temporary as the proposed action also includes restoration of the treatment area wherein native trees and shrubs would be planted. In addition, noise and human activities during treatments would disrupt birds causing them to flush from cover or completely avoid the area. This disturbance would only occur during daylight hours when the treatment areas are being treated. Depending on the time of year, there is the potential to disturb nesting birds within or immediately adjacent to the proposed action. Over the long-term, there would be beneficial impacts to migratory bird species as the existing tamarisk would be replaced by native vegetation which would provide more diverse and better habitat for migratory bird species.

### **4.1.6.2. No Action**

Under the No Action Alternative, migratory bird population utilization of habitat in Pahranaagat Wash would likely remain stable. As hazardous fuels increase, and existing piles continue to dry, there may be an increased potential for wildfire in the area. In the event of a widespread wildfire in the wash, perches and nesting sites would be removed until plant species recover post-fire.

## **4.1.7. Soils**

### **4.1.7.1. Proposed Action**

The proposed action will impact the local soils behind the Arrow Canyon dam due to increased flow and flow velocity through the wash and floodplain. Depending on climatic conditions, increased flow and flow velocity after vegetation removal will result in increased erosion and sediment transport. This increase, however, is only temporarily until vegetation becomes reestablished. During this time the channel upstream of the dam may become more incised. Further, more sediment may be transported through the dam's 24-inch pipe to the wash downstream of the dam, emulating conditions more similar to those prior to dam construction. Over time salinity levels of the soil is likely to decrease once tamarisk trees have been removed.

### **4.1.7.2. No Action**

If no action is taken the short term erosion and sediment transport will not take place. However, persisting presents of tamarisk may increase the salinity levels of the soils upstream of the dam.

## **4.1.8. Water Resources/Quality (drinking/surface/ground)**

### **4.1.8.1. Proposed Action**

The proposed action will increase flow velocity in the floodplain and potentially cause a minimal and temporary increase in erosion as discussed above. While salinity in the wash will decrease, due to tamarisk removal, turbidity may increase during flow events.



#### **4.1.8.2. No Action**

If no action is taken the short term increases in turbidity will not take place. However, persisting presents of tamarisk may increase the salinity levels of the groundwater upstream of the dam.

#### **4.1.9. Wetlands/Riparian Zones**

##### **4.1.9.1. Proposed Action**

The proposed action will alter flow velocity and riparian vegetation to more desirable conditions. These desirable conditions include native vegetation within the riparian zone and natural flow processes.

##### **4.1.9.2. No Action**

If no action is taken the desirable impacts to the riparian zone will not take place.

#### **4.1.10. Wilderness/WSA**

##### **4.1.10.1. Proposed Action**

Treatments and restoration would reduce the untrammeled quality because it is an intentional human control and manipulation of wilderness. Use of motorized equipment would negatively affect the undeveloped character. Treatments of weeds followed by restoration would benefit this quality by enhancing native vegetation, habitat, and ecosystem function. In the short term the presence of crews and use of motorized equipment would adversely affect the wilderness experience in those areas. In the long term restoration of native vegetation would serve to enhance the wilderness recreation experience. Treatments would benefit prehistoric cultural resources by reducing potential damage from direct flame impingement resulting from wildland fire. The use of motorized equipment (i.e. chainsaws) reduces the contrast between wilderness and other lands. The use of backpack sprayers helps maintain traditional skills. Timing constraints exist for burn periods and herbicide applications. Specialized training to use a chainsaw and apply herbicides is minimal, as are costs. Use of chainsaws would reduce the time required for crews to be in the treatment area and best fulfill constraints regarding timing of activities. Visitors would not be allowed in area during burn periods. Effects on visitors can be minimized by making the areas and times of treatment known. No additional safety considerations are anticipated. Standard risks involved with hiking, tool use, and herbicide application.

##### **4.1.10.2. No Action**

No treatments and restoration would occur and therefore the untrammeled quality of wilderness would not be impacted. The undeveloped character would not be beneficially or negatively impacted. Wilderness is to be “protected and managed so as to preserve its natural conditions.” Wilderness ecological systems should be substantially free from the effects of modern civilization. The presence of non-native invasive weeds and fuel loads interferes with the natural conditions of the wilderness resource. Whether any action is taken or not, the natural conditions of wilderness are threatened. The spread of weeds and increased fuels is partly caused or enhanced by human

actions (seed introduction and spread). To allow weeds to continue to expand and fuels continue to build would be a direct sign of unintentional human influence. Action would preserve the natural character by ensuring that indigenous species (including threatened species), patterns, and ecological processes are protected. The wilderness recreation experience is in part dependent on the wilderness setting representing a natural and native ecosystem. If non-native invasive weeds are allowed to spread and eventually replace native vegetation, the human experience in wilderness would be negatively affected. The effects include changes in vegetation type and also habitat and wildlife species that depend on natural conditions. This wilderness contains important prehistoric cultural resources for which the area was designated. Action to reduce fuel loads would lessen the chances for wildland fires to damage (e.g., spall) cultural sites such as petroglyphs and pictographs. In the long term restoration of native vegetation would serve to enhance the wilderness recreation experience. Treatments would benefit prehistoric cultural resources by reducing potential damage from direct flame impingement resulting from wildland fire. It can be argued that the presence and spread of weed species in wilderness will degrade the quality of the recreation experience in wilderness as native species are replaced. This may happen due to the changes in vegetation and effects on scenery and habitat. Non-native invasive weeds have the potential to lower the scenic quality of an area. Non-native invasive weeds tend to interfere with the growth of native plant species (noxious) and may actually cause populations of natural plant species to decline. They also degrade the habitat for native wildlife species.

#### **4.1.11. Woodland/Forestry**

##### **4.1.11.1. Proposed Action**

As vehicles are restricted to existing designated roads and springs to be treated are not suitable habitat for cactus and yuccas, no impacts to cactus and yucca are expected.

There will be a temporary negative effect to the invasive riparian woodland, as invasive tamarisk trees and other species will be removed through manual and chemical treatments. Herbicides pose some risk to non-target vegetation; however, these impacts will be reduced by their proper use and application as described in the proposed action and the herbicide label. Short-term impacts to these vegetation communities would be offset by a reduction in competition with non-native species and an increase in native plant species cover and diversity.

Native trees present in the treatment area (willows, mesquites, acacias) will be avoided by the proposed treatments. Control burn events are to take place a sufficient distance away from native trees to ensure they will not be impacted.

The proposed action will increase the native mesquite acacia woodlands habitat which provides a more diverse community for wildlife species. Additionally the risk of future wildland fires in the area will be reduced.

##### **4.1.11.2. No Action**

If no action is taken the area will continue to be dominated by invasive species, and the area would not be restored to native mesquite acacia woodlands habitat.

## 4.2. Cumulative Effects

The Council of Environmental Quality (CEQ) regulations implementing NEPA define cumulative impacts as "...[T]he impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions (RFFA) regardless of what agency (Federal or Non-Federal) or person undertakes such actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

### Past, Present, and Reasonably Foreseeable Future Actions

On the basis of agency records, GIS analysis and interdisciplinary team discussion the following past, present and RFFA, which have impacted or may impact the affected resources within the assessment area to varying degrees, have been identified:

#### Past Actions

Prior to Wilderness designation by Congress, this location was included in what was once the Arrow Canyon Wilderness Study Area. The Pahrnatagat Wash area, including Arrow Canyon, was used as a jeep route. In 1930, the US government constructed a dam in the western end of Arrow Canyon. The dam remains in the area. There was a human presence in the area prior to cattlemen and settlers, as is evident from the presence of petroglyphs (prehistoric rock art). There is a recently installed ROW that must be crossed.

#### Present Actions

The scope of analysis encompasses the entire Pahrnatagat Wash along with drainages, roadways and trailways leading into the basin. There is one approved roadway leading up to the wash. There is currently a bladed trailway running through the infested area. A Wilderness Management Plan is presently being developed. This will be implemented in the reasonably foreseeable future.

#### Reasonably Foreseeable Future Actions

Long term cumulative effects are not expected as a result of this project though future projects will likely take place. The RFFAs within the project area include: revegetation projects, both natural and by the BLM, developing staging areas, installing signs near other potentially higher use access areas, and constructing barriers to prevent off road vehicle use in the wilderness.

## 4.3. Mitigation

Mitigation measures are those measures that could reduce or avoid adverse impacts and have not been incorporated in the Proposed Action or the No Action Alternative. To ensure potential impacts to the area are minimized, the measures listed below will be added as Standard Stipulations

### 4.3.1. Migratory Birds

The proponent will be required to adhere to the following mitigation measures to minimize and avoid effects to migratory birds:

- At each site ensure not to remove all migratory bird nesting and perching sites to ensure bird species that utilize the tamarisk habitat would not have their habitat entirely removed until native vegetation grows in. Seek site specific guidance from BLM Wildlife Biologist prior to treatments.
- To prevent undue harm, vegetation and chemical treatments should be scheduled outside bird breeding season. The bird breeding season generally occurs between March 1st and August 31st.
- If a project that has to occur during the breeding season, then a qualified biologist must survey the area for nests prior to commencement of construction activities. This shall include burrowing and ground nesting species in addition to those nesting in vegetation. If any active nests (containing eggs or young) are found, an appropriately-sized buffer area must be avoided until the young birds fledge.

### 4.3.2. Wilderness/WSA

- Timing will consider visitor use of the area, and whenever possible will be scheduled during periods of low visitor use (i.e., weekdays).
- Seven days prior to undertaking treatment and restoration activities, personnel shall notify the BLM Wilderness Specialist.
- On an annual basis, a summary of activities shall be provided to the BLM Wilderness Specialist to include: 1. type of activity (i.e., weed treatment, restoration); 2. methods for weed treatment (i.e., burning, cutting/pulling, herbicide); 3. weed species treated (i.e., Scotch thistle, Malta starthistle, tamarisk, cheatgrass, red brome, Sahara mustard); 4. methods of restoration (i.e., planting or seeding); 5. number of days for each piece of equipment where motorized equipment (i.e., chainsaws) was used.

### 4.3.3. Woodland/Forestry

- Native trees present in the treatment area (willows, mesquites, acacias) will be avoided by the proposed treatments. Control burn events and herbicide application are to take place a sufficient distance away from native trees to ensure they will not be impacted.

## **Chapter 5. Tribes, Individuals, Organizations, or Agencies Consulted:**

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**Table 5.1. List of Persons, Agencies and Organizations Consulted**

<b>Name</b>	<b>Purpose &amp; Authorities for Consultation or Coordination</b>	<b>Findings &amp; Conclusions</b>
U.S. Fish and Wildlife Service	Endangered Species Act	
Nevada Wilderness Project	Notification of Proposed Action	Support letter sent to the District Manager

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## **Chapter 6. List of Preparers**

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In accordance with the systematic and interdisciplinary approach specified in 40 CFR 1501.2a, the BLM and contractors selected a team of resource specialists to systematically plan and analyze all project components that may have an impact on the physical or human environment. The team consisted of the following personnel:

**Table 6.1. List of Preparers**

<b>Name</b>	<b>Title</b>	<b>Responsible for the Following Section(s) of this Document</b>
Jayson Barangan	Natural Resource Specialist (Wildlife)	BLM Sensitive Wildlife, T&E Species, Migratory Birds, Fish and Wildlife excluding Federally Listed, ACEC
Lisa Christianson	Air Resources Specialist	Air Quality, Greenhouse Gas Emissions
Jill Craig	Natural Resource Specialist (Weeds)	Invasive Species/Noxious Weeds
John Evans	Planning and Environmental Coordinator	Environmental Justice, Human Health and Safety
Krystal Johnson	Wild Horse and Burro Specialist	Livestock Grazing, Wild Horse and Burro
Sendi Kalcic	Wilderness Specialist	Wilderness/WSAs, LWC
Katie Kleinick	Natural Resource Specialist (Renewable)	Forestry, T&E plants, BLM sensitive plants,
Marilyn Peterson	Outdoor Recreation Specialist	Recreation
Boris Poff	Hydrologist	Floodplains, Hydrologic Conditions, Water Resources, Wetlands
Lucas Rhea	Fire Management Specialist	Fuels/Fire Management
Susanne Rowe	Archaeologist	Cultural, Paleontological Resources, Native American Religious Concerns
Kerri-Anne Thorpe	Realty Specialist	Lands, Access
George Varhalmi	Geologist	Geology, Minerals, Energy production

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## **Chapter 7. Other material**

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# **Appendix A. Standard Operating Procedures For Herbicide Application**

## **Standard Operating Procedures For Herbicide Application**

### ***Application Method and Requirements***

Only BLM approved herbicides will be used for the Proposed Project. Herbicides used on the project will be applied by hand using a backpack sprayer.

Any herbicide application will be done by a State Licensed Herbicide Applicator using standard, approved application techniques.

Any and all herbicide treatments will follow BLM procedures outlined in BLM Handbook H-9011-1 (Chemical Pest Control), and manuals 1112 (Safety), 9011 (Chemical Pest Control), and 9015 (Integrated Weed Management), and will meet or exceed state label standards. Treatments will comply with the United States Environmental Protection Agency (USEPA) label.

Re-applications of the herbicide will not be less than the persistence factor identified for the herbicide.

### ***Project Inspection***

Chemical label directions will be followed. BLM procedures and methods will be followed as set forth in the Vegetation Treatment on BLM Lands in Thirteen Western States 1991, and the Vegetation Treatment Using Herbicide on Bureau of Land Management Lands in 17 Western States 2007.

### ***Storage and Mixing of Herbicide***

No hazardous materials shall be stored or disposed of on-site. Fuel, oil and grease needed for equipment maintenance during the working period may be stored on site where no leakage or spillage will contaminate the ground. Any spilled materials will be immediately cleaned up and disposed of and the BLM Project Inspector will be notified of the spill. No equipment maintenance, rinsing, or mixing of chemicals will be performed within, or near, any stream channel or waters where chemicals, petroleum products or other pollutants from equipment may enter these waters. Herbicides will not be stored on the project site. Product label directions and MSDS will be available on site for reference in case of spill or exposure. All unused herbicides or empty containers will be disposed of by the licensed herbicide applicator in accordance with the USEPA label at an approved disposal site.

### ***Weather Restrictions***

Wind velocities for herbicide applications must be 10 m.p.h. or less in all instances to reduce drift potential. Herbicide application will not occur during precipitation events. It may occur 48 hours before or after precipitation events according to label direction.

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# Appendix B. Noxious Weed List

## Noxious Weed List

### NAC 555.010 Designation and categorization of noxious weeds.

#### DEFINITIONS

Category "A": Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state in all infestations.

Category "B": Weeds established in scattered populations in some counties of the state; actively excluded where possible, actively eradicated from nursery stock dealer premises; control required by the state in areas where populations are not well established or previously unknown to occur.

Category "C": Weeds currently established and generally widespread in many counties of the state; actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer.

Common Name	Scientific Name
<b>Category A Weeds</b>	
African Rue	<i>Peganum harmala</i>
Austrian fieldcress	<i>Rorippa austriaca</i>
Austrian peaweed	<i>Sphaerophysa salsula</i>
Black henbane	<i>Hysocyamus niger</i>
Camelthorn	<i>Alhagi pseudalhagi</i>
Common crupina	<i>Crupina vulgaris</i>
Dalmatian toadflax	<i>Linaria dalmatica</i>
Dyer's woad	<i>Isatis tinctoria</i>
Eurasian water-milfoil	<i>Myriophyllum spicatum</i>
Giant reed	<i>Arundo donax</i>
Giant salvinia	<i>Salvinia molesta</i>
Goats rue	<i>Galega officinalis</i>
Green fountain grass	<i>Pennisetum setaceum</i>
Houndstongue	<i>Cynoglossum officinale</i>
Hydrilla	<i>Hydrilla verticillata</i>
Iberian starthistle	<i>Centaurea iberica</i>
Klamath weed	<i>Hypericum perforatum</i>
Malta starthistle	<i>Centaurea melitensis</i>
Mayweed chamomile	<i>Anthemis cotula</i>
Mediterranean sage	<i>Salvia aethiopis</i>
Purple loosestrife	<i>Lythrum salicaria</i> , <i>Lythrum virgatum</i> and their cultivars
Purple starthistle	<i>Centaurea calcitrapa</i>
Rush skeletonweed	<i>Chondrilla juncea</i>
Sow thistle	<i>Sonchus arvensis</i>
Spotted knapweed	<i>Centaurea maculosa</i>
Squarrose knapweed	<i>Centaurea virgata</i>
Sulfur cinquefoil	<i>Potentilla recta</i>
Syrian bean caper	<i>Zygophyllum fabago</i>
Yellow starthistle	<i>Centaurea solstitialis</i>
Yellow toadflax	<i>Linaria vulgaris</i>
<b>Category B Weeds</b>	
Carolina horse nettle	<i>Solanum carolinense</i>

Diffuse knapweed	<i>Centaurea diffusa</i>
Leafy spurge	<i>Euphorbia esula</i>
Medusahead	<i>Taeniatherum caput-medusae</i>
Musk thistle	<i>Carduus nutans</i>
Russian knapweed	<i>Acroptilon repens</i>
Sahara mustard	<i>Brassica tournefortii</i>
Scotch thistle	<i>Onopordum acanthium</i>
White horse nettle	<i>Solanum elaeagnifolium</i>
<b>Category C Weeds</b>	
Canada thistle	<i>Cirsium arvense</i>
Hoary cress	<i>Cardaria draba</i>
Johnson grass	<i>Sorghum halepense</i>
Perennial pepperweed	<i>Lepidium latifolium</i>
Poison Hemlock	<i>Conium maculatum</i>
Puncture vine	<i>Tribulus terrestris</i>
Salt cedar (tamarisk)	<i>Tamarix spp.</i>
Water Hemlock	<i>Cicuta maculata</i>

# Appendix C.